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We put science to work.™

Innovations

from Savannah River National Laboratory

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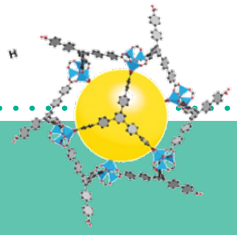


What is ARPA-E?

ARPA-E was launched in 2009 to seek transformational, breakthrough technologies that are too risky for private-sector investment, but have the potential to promote quantum leaps in energy technology, form the foundation for new industries, and have large commercial impacts.

Demonstrating the success ARPA-E has already seen, the program announced last year that 11 of its projects secured more than $200 million in outside private capital investment after initial funding from its programs.

To date, ARPA-E has attracted over 5,000 applications from research teams, resulting in approximately 180 groundbreaking projects worth nearly $500 million.

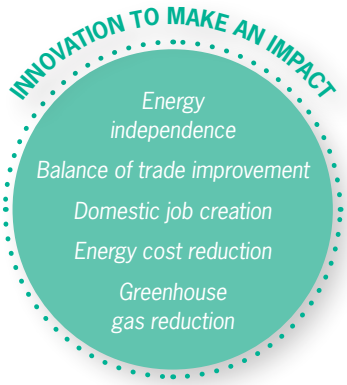
Contact Information

SRNL Office of Communications
803.725.4396

Natural gas fuel systems for vehicles

Innovation and collaboration

Today's natural gas vehicle technologies require tanks that can withstand high pressures, are often cumbersome, and are either too large or too expensive to be suitable for light duty passenger vehicles. The Savannah River National Laboratory (SRNL) in partnership with Ford Motor Company, the University of California-Berkeley, and BASF has been awarded $5.5 million by the Department of Energy to help develop vehicles fueled by natural gas. This research will explore an innovative low pressure material-based natural gas fuel system for automobiles and other light vehicles.



Innovation to reduce pressure

The Advanced Research Projects Agency-Energy (ARPA-E) funded project will accelerate the use of natural gas in vehicles by reducing the pressure of on-board tanks with a proposed technology using adsorbed natural gas (ANG). The project will use high surface area materials within a heat exchange system to increase the natural gas density far beyond that which can be achieved at similar pressures.

Innovation to reduce cost

The first focus of the project is to develop improved metal-organic frameworks to adsorb the natural gas at high densities. Building on SRNL's extensive knowledge of hydrogen storage materials and systems, researchers here are responsible for designing and testing high performance fuel systems to use these next-generation

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Metal organic framework

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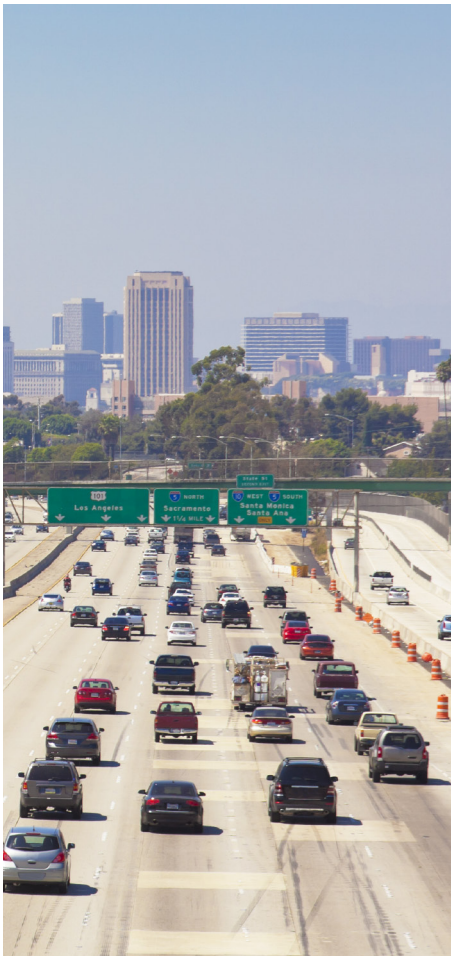
Innovations from Savannah River National Laboratory

Innovation to reduce cost *(continued)*

metal-organic frameworks. This innovative research has the potential to lower the cost of storage tanks and compressors at the fueling station, resulting in increased use of natural gas vehicles.

Compressed natural gas (CNG) is composed primarily of methane. It is typically stored and distributed in expensive pressure vessels at 3,000 to 3,600 psi. About 85 percent of the CNG used in the United States is produced domestically. CNG is used in traditional gasoline internal combustion engines that have been modified for its use. The benefits of CNG are numerous; it is a nontoxic, clean-burning fuel and significantly reduces carbon monoxide, carbon dioxide and nitrogen oxides compared to gasoline. According to the U.S. Environmental Protection Agency, use of CNG can result in 30-40 percent less greenhouse gas emissions.



"MOVE" toward a solution

The SRNL research is one of 13 cutting-edge research projects that will receive a total of $30 million to find new ways of harnessing America's abundant natural gas supplies for cars and trucks, and expand the use of natural gas as a vehicle fuel. Through ARPA-E, the Department's new program, titled Methane Opportunities for Vehicular Energy—or "MOVE"—aims to engineer light-weight, affordable natural gas tanks for vehicles and develop natural gas compressors that can efficiently fuel a natural gas vehicle at home.

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